I CLAIM:

1. Methods of operating surface reactors comprising the steps of:

providing a reactor body having a reactor surface;

feeding a first reactant to the reactor surface at a first entry location and at a rate such that the reactant spreads out on the surface from the entry location in the form of a first thin film;

feeding a second reactant to the reactor surface at a second entry location and into the first film in the form of a second thin film in order to interact with the first film; and

collecting the resultant product of the first and second films at the periphery of the surface

2. A method as claimed in claim 1, wherein the second film is fed into the first film at a first distance from the first entry location, and a third film of a third reactant is fed into the film formed by the mixture of the first and second reactants at a third entry location at a second distance from the first entry location.

3. A method as claimed in claim 1, wherein the reactor surface is provided by a rotor mounted by a support body and spun about a rotation axis;

wherein the reactor surface extends radially from the rotation axis; and

wherein the films move radially on the reactor surface under centrifugal force provided by the spinning of the rotor.

4. A method as claimed in claim 1, wherein each film is fed into the respective film that receives it so as to overcome the impedance to interaction between the two films imposed by the existence of molecular clusters in the films.

5. A method as claimed in claim 1, wherein each film is fed into the respective film that

receives it at a rate such as to break up the molecular clusters in the film to which it is fed and thereby permit the molecules of the films to aggressively and completely bond with one another to form a resultant product.

6. A method as claimed in claim 1, wherein each film is fed into the respective film that receives it through a respective circular venturi nozzle producing an increase in the velocity of the film for its encounter with the corresponding film.

7. A method as claimed in claim 1, wherein a retaining surface is provided coextensive with the reactor surface and passage of the films takes place in a gap formed between the reactor and the retaining surface.

8. A method as claimed in claim 1, wherein a retaining surface is provided coextensive with the reactor surface and passage of the films takes place in a gap formed between the reactor and retaining surfaces, and wherein the thickness dimension of the gap can be varied and is less than 1.00 mm (0.04 in), and preferably is less than 0.5 mm (0.02 in).

9. A method as claimed in claim 1, wherein a retaining surface is provided coextensive with the reactor surface and passage of the films takes place in a gap formed between the reactor and retaining surface, and wherein the retaining surface is provided with heat exchange means to heat or cool the reactants passing in the gap.

10. A method as claimed in claim 1, wherein the reactor surface is polished to a glass-like smoothness.

11. A surface reactor comprising:

a reactor body having a reactor surface;

means for feeding a first reactant to the reactor surface at a first entry location and

at a rate such that the reactant spreads out on the surface from the entry location in the form of a first thin film;

means for feeding a second reactant to the reactor surface at a second entry location and into the first film in the form of a second thin film in order to interact with the first film; and

means for collecting the resultant product of the first and second films at the periphery of the surface.

12. A surface reactor as claimed in claim 11, wherein the means feeding the second film feed it into the first film at a first distance from the first entry location, and means feeding a third film of a third reactant into the film formed by the mixture of the first and second reactants at a third entry location at a second distance from the first entry location.

13. A surface reactor as claimed in claim 11, and wherein the reactor surface is provided by a rotor mounted by a support body and spun about a rotation axis;

wherein the reactor surface extends radially from the rotation axis; and

wherein the films move radially on the reactor surface under centrifugal force provided by the spinning of the rotor.

14. A surface reactor as claimed in claim 11, wherein each film is fed into the respective film that receives it so as to overcome the impedance to interaction between the two films imposed by the existence of molecular clusters in the films.

15. A surface reactor as claimed in claim 11, wherein each film is fed into the respective film that receives it at a rate such as to break up the molecular clusters in the film to which it is fed and thereby permit the molecules of the films to aggressively and completely bond with one another to form a resultant product.

16. A surface reactor as claimed in claim 11, wherein the means feeding each film into the respective film that receives it comprises a respective circular venturi nozzle producing an increase in the velocity of the film for its encounter with the corresponding film.

17. A surface reactor as claimed in claim 11, and comprising means providing a retaining surface coextensive with the reactor surface, whereby passage of the films takes place in a gap formed between the reactor and the retaining surface.

18. A surface reactor as claimed in claim 11, and comprising means providing a retaining surface coextensive with the reactor surface, whereby passage of the films takes place in a gap formed between the reactor and retaining surfaces, and wherein the thickness dimension of the gap is less than 1.00mm (0.04in), and preferably is less than 0.5mm (0.02in).

19. A surface reactor as claimed in claim 11, and comprising means providing a retaining surface coextensive with the reactor surface, whereby passage of the films takes place in a gap formed between the reactor and retaining surfaces, which gap can be made to be variable in its dimension, and comprising heat exchange means operative with the retaining surface to heat or cool the reactants passing in the gap.

20. A surface reactor as claimed in claim 11, wherein the reactor surface is polished to a glass-like smoothness.